

deep VIA etch

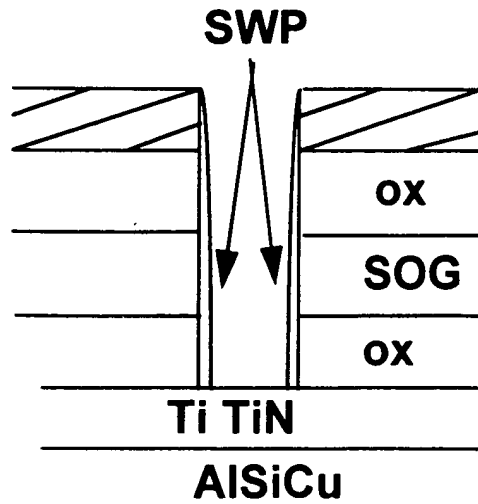


Figure 1: Schematic representation of deep via etch structure (not to scale)

Al-Overetched

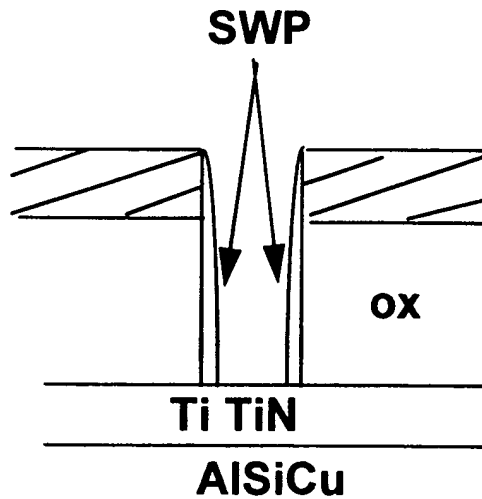


Figure 2: Schematic representation of Al overetched via structure (not to scale)

Gasphase set-up

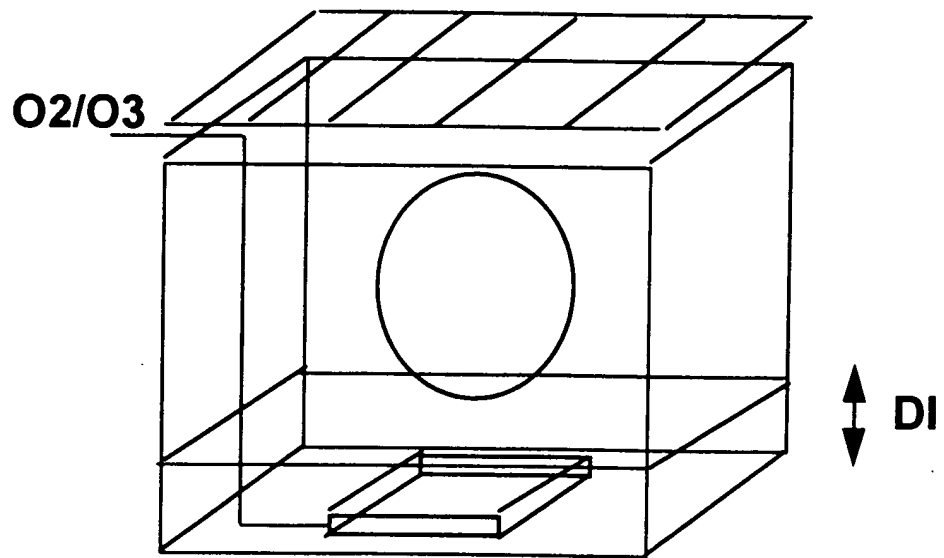


Figure 3: Moist gas-phase experimental set-up

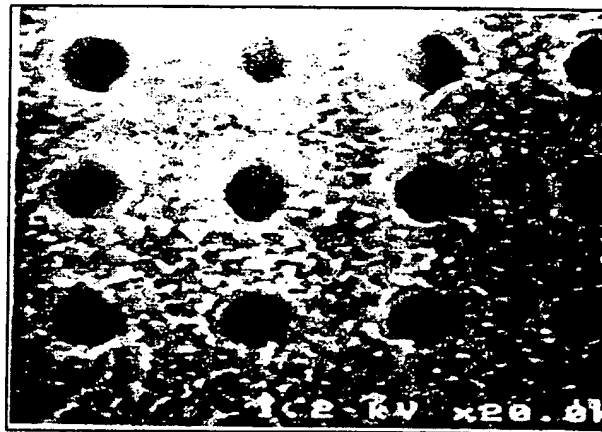


Figure 4: SEM micrograph of via structure prior to any cleaning treatment.

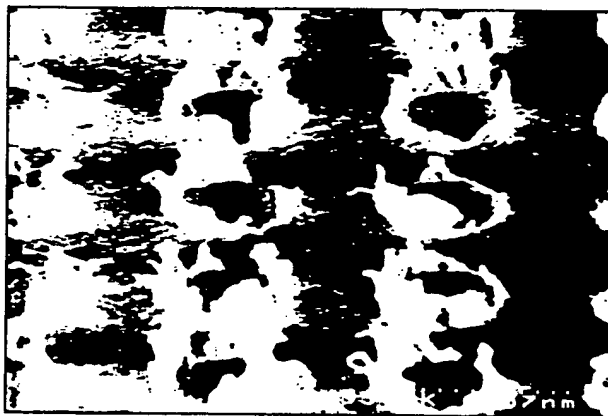


Figure 5: SEM micrograph after 45' O₂ dry strip



Figure 6: SEM micrograph of deep via (figure 1) after 10' exposure to moist ozone gasphase process with acetic acid spiking.



Figure 7: SEM micrograph of Al overetched via (figure 2) after 10' exposure to moist ozone gasphase process with acetic acid spiking.

Bubble set-up

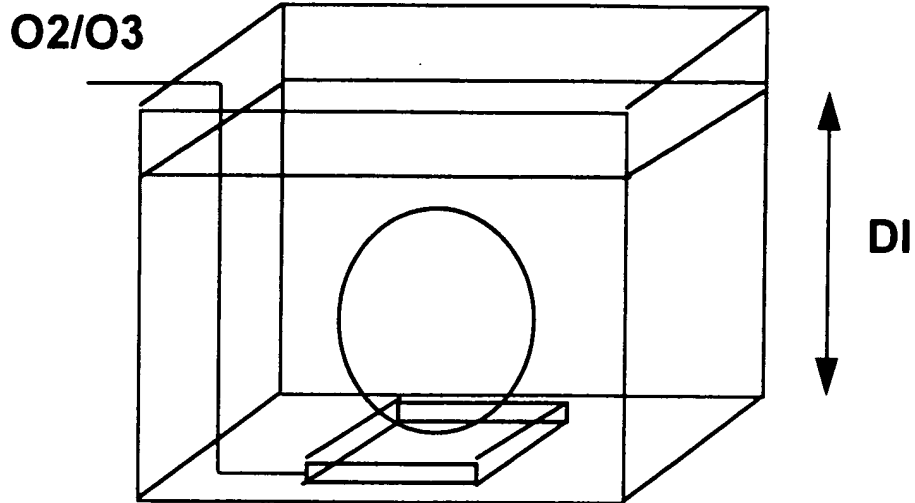


Figure 8: Ozone bubble immersion experimental set-up

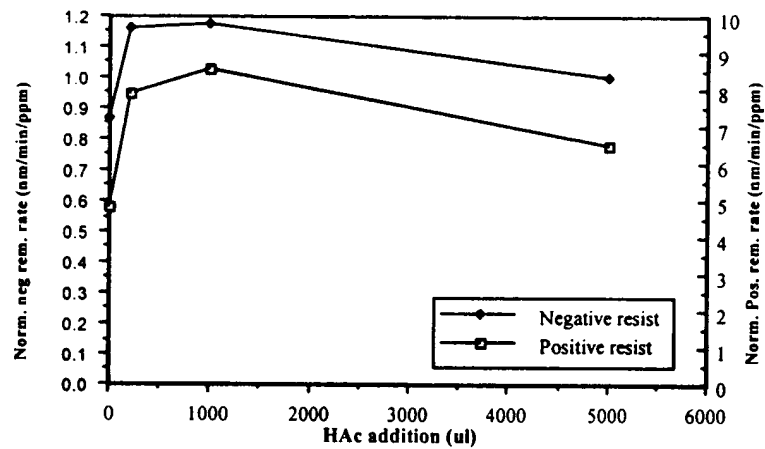


Figure 9: Resist removal process efficiency number (nm removal / process time * ozone concentration) for positive and negative resist removal as a function of acetic acid concentration.

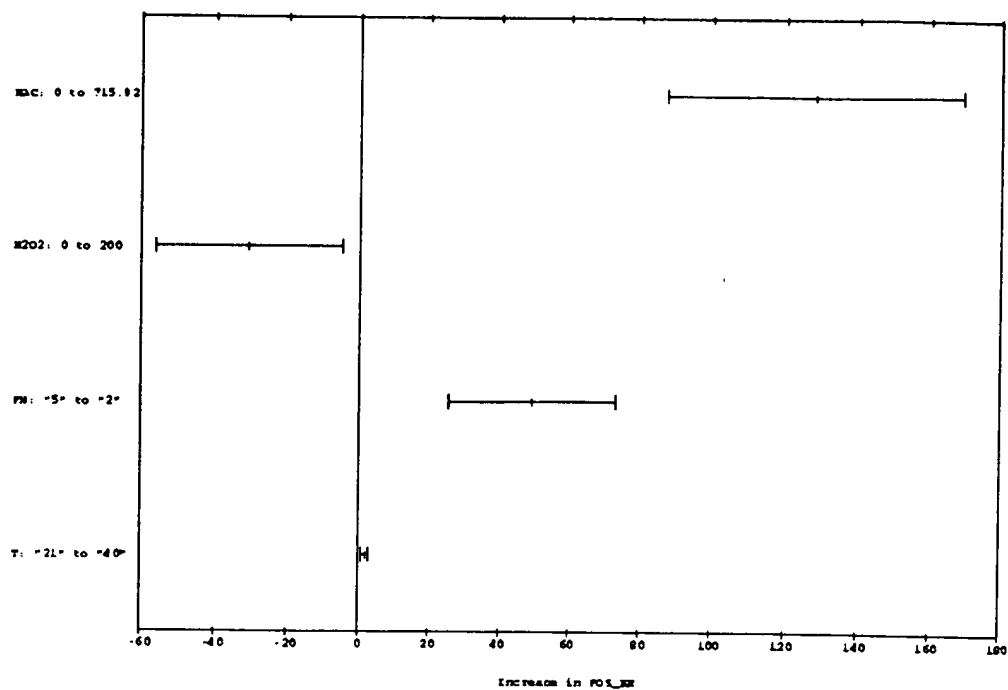


Figure 10: Main parameter effects on resist removal rate (nm removal / process time) for positive resist removal (with 95% confidence levels).

Analysis: OZONE_120512.FEED, Model: OZONE_122_AUTO_FEED
Main Effects on Transformed Response FOR_ER_FED_0
(with 95% Confidence Intervals)

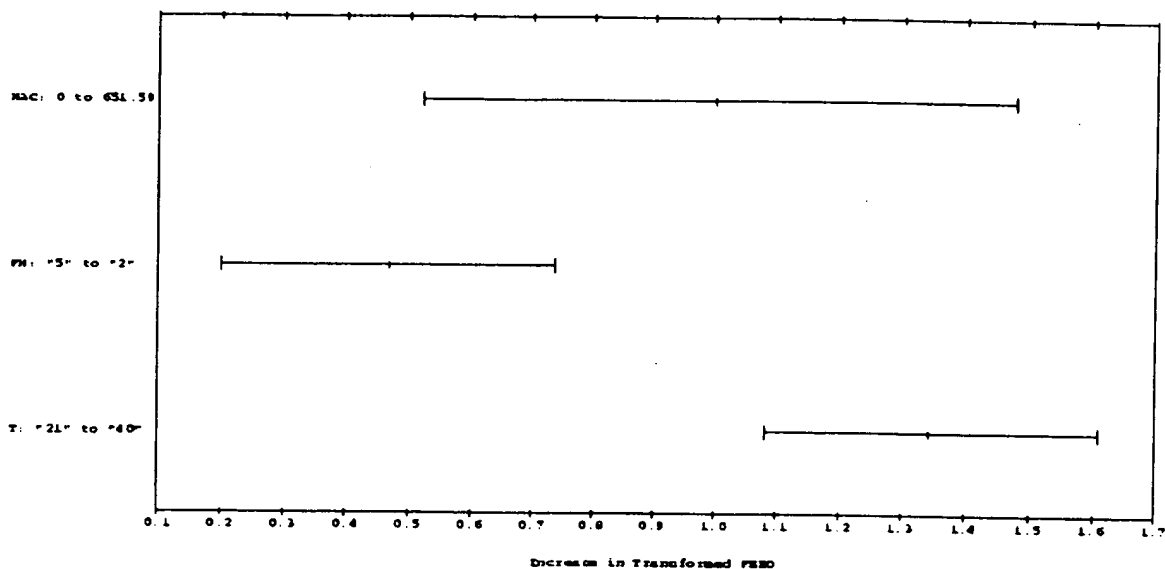


Figure 11: Main parameter effects on resist removal process efficiency number (nm removal / process time * ozone concentration) for positive resist removal (with 95% confidence levels).

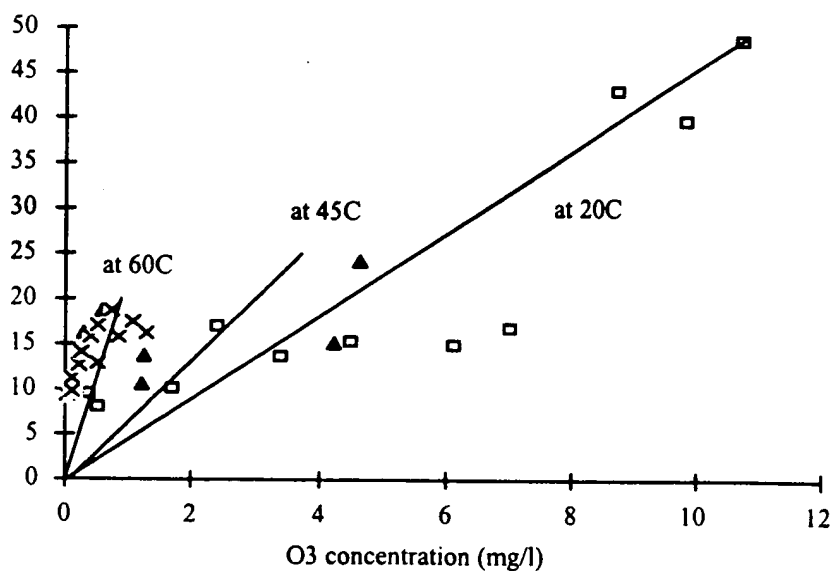


Figure 12: Resist removal efficiency as a function of temperature and ozone concentration for a static system.

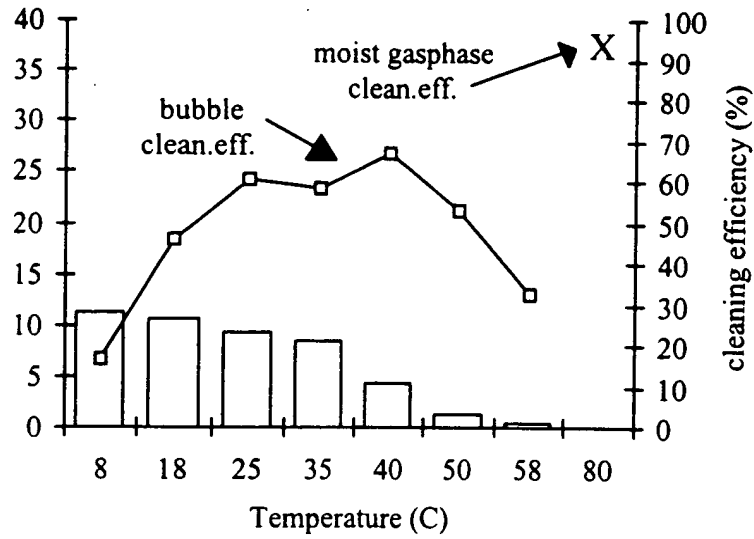


Figure 13 Resist removal efficiency as a function of temperature and ozone concentration for bubble and moist gasphase set-up.

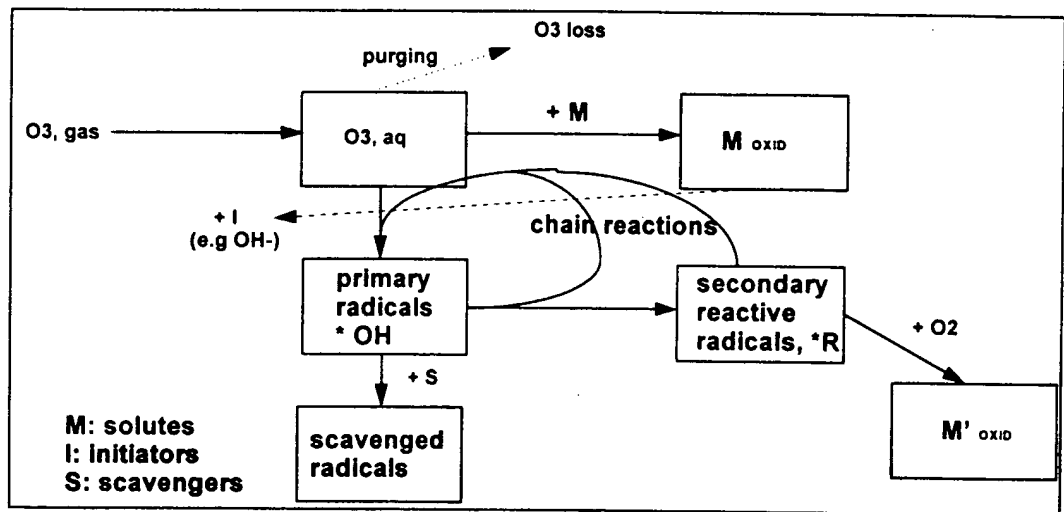


figure 14: Scheme of reactions of aqueous ozone.

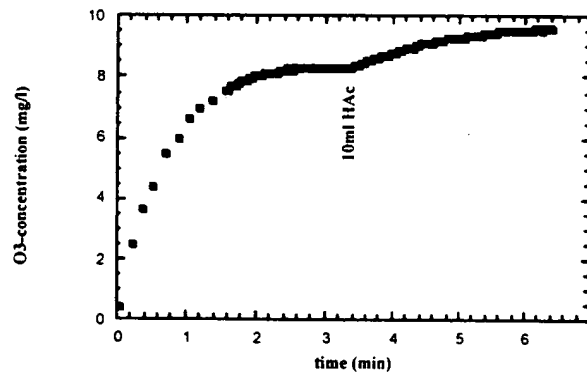


Figure 15: effect of OH radical scavenging on ozone concentration in an overflow tank.

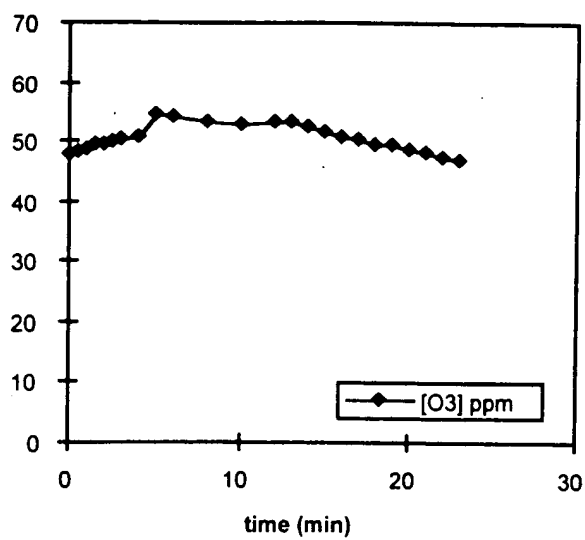


Figure 16: effect of repeated addition of H_2O_2 (0.17mmol/l at $t = 0, 13, 20, 24$ min) to a DI water solution spiked with 0.23mmol/l of acetic acid.